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PHYTOGEOGRAPHIC STUDIES IN ONTARIO

1. THE GENUS *UVULARIA* IN SOUTHERN ONTARIO

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WHEN the preliminary check list of the flora of southern Ontario was being compiled (12), it was found necessary to verify the occurrence in that area of a number of species which had been known earlier but not collected nor reported within recent years. Among these was one of the Bellworts, *Uvularia perfoliata* L., a species frequently confused with *Uvularia grandiflora* J. E. Smith, the more common plant in our region.

According to Anderson and Whitaker (1), *Uvularia grandiflora* is the more widespread and the more western of these two species, occurring from Quebec and New England to Wisconsin and south to Missouri, whereas *U. perfoliata* shows a distribution along the Alleghany mountains and the coastal plain from New England to Georgia, with an extension westward to western New York and Pennsylvania in the Lake Erie region. On their map (loc. cit., p. 38, fig. 5) are shown six stations for *U. grandiflora* in Canada (southern Quebec and eastern Ontario, but none in southwestern Ontario) and only one for *U. perfoliata* on the Niagara peninsula of southwestern Ontario.

A study was therefore undertaken to determine more fully the distribution of these species in Ontario. An examination was made of herbarium specimens and living plants were studied in the field during the past summers' field work on the flora of southern Ontario. In May, 1950, an unreported station for the rare *U. perfoliata* was located in the Niagara district, and in

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May, 1951, a second station was discovered in the vicinity of Hamilton. The scope of the study was broadened to include the related species, *U. sessilifolia*, and its distribution will also be discussed.

DESCRIPTION AND DISCUSSION OF SPECIES

Uvularia is represented in Ontario by three species, viz. *U. grandiflora* J. E. Smith, *U. perfoliata* L., and *U. sessilifolia* L. The last of these, *U. sessilifolia*, is quite distinct and easily recognized by its elongate rhizome, its sessile (but not perfoliate) leaves, and its ellipsoid capsule. By some authors it has been placed in a separate genus (*Oakesia* S. Watson; *Oakesiella* Small), but in view of the cytological evidence presented by Anderson and Whitaker (1) such a treatment seems artificial.

The other two species, *U. grandiflora* and *U. perfoliata*, are more alike, both of them having a short rhizome, perfoliate leaves, and a truncate capsule. They have been confused by many collectors and, unless it is possible to locate verifying specimens, most reports of these species in the early literature must be considered with some doubt. The morphological differences between *U. grandiflora* and *U. perfoliata* have been studied in great detail by Anderson and Whitaker, who applied a statistical analysis. They have also been pointed out by C. C. Deam (2), by M. L. Fernald (4), and by Wiegand and Eames (13). The main differences are summarized below.

Uvularia grandiflora.—This species is usually larger and somewhat more branched and more leafy than the second. The plant is not glaucous but the leaves are whitish-pubescent beneath. The inner surface of the perianth-segments is smooth, not granular-roughened, and the stamens exceed the style.

Uvularia perfoliata.—This species is generally smaller than the first, with a somewhat less branched and less leafy habit. The leaves are glaucous and glabrous. It can be distinguished readily by the presence on the inner surface of the perianth-segments of a number of small, but clearly visible, granular or papillate projections. The stamens are shorter than the style.

It will be seen from the summary given above that some of the differences between these two species are of a qualitative nature. The character of the inner surface of the perianth, however, is usually definitive. On the basis of measurements of the size and

shape of leaves and of other characters, Anderson and Whitaker concluded that the two species could always be separated by a combination of characters if a single character did not suffice. It was also pointed out that the two species occupy largely distinct natural areas in North America and that where overlapping does occur, they are found in different habitats within the same general area. This was also found to be true in the present study with respect to the habitats occupied in southern Ontario.

Wiegand and Eames (13) called attention to the difference in the flowering dates of the two species in question. This difference is also apparent in Ontario, although the data are few for *U. perfoliata* because of its rarity. The average date of flowering for *Uvularia grandiflora* in Ontario is May 15th (based on 81 collections); for *Uvularia perfoliata* it is May 30th (based on 7 collections). Thus, in spite of the fact that *U. perfoliata* is found only in the extreme southern part of the province where the growing season opens earliest, its flowering date is about two weeks later than that of *U. grandiflora*.

KEY TO THE SPECIES OF UVULARIA IN ONTARIO

- A. Leaves perfoliate; rhizome short; capsule obovoid, truncate, three-lobed or angled, but not winged.....B.
- B. Plant not glaucous, leaves usually whitish-pubescent or puberulent beneath; inner surface of perianth-segments smooth, not granular-roughened; stamens exceeding the style.....1. *U. grandiflora*.
- B. Plant glaucous and glabrous; inner surface of perianth-segments bearing some small, but clearly visible, granular or papillate projections; stamens shorter than the style.....2. *U. perfoliata*.
- A. Leaves sessile but not perfoliate; rhizome elongate; capsule ellipsoid, tapering at each end, with three winged angles.....3. *U. sessilifolia*.

DISTRIBUTION OF SPECIES

The distribution of the three species of *Uvularia* has been plotted on outline maps of southern Ontario (see figs. 1, 2, 3) on the basis of the specimens examined in the field and in the herbaria, together with any published or unpublished reports that were considered authentic. Specimens have been cited under each species to give records for the counties and districts of Ontario, but many which are nearly duplicates or merely additional records from the same county have been omitted.

Symbols and Abbreviations.—Four types of symbols have been used to distinguish the different kinds of records on the maps. The locations of collection of specimens examined in the herbarium are shown as black dots; those for plants examined by the author in the field but not collected—as open circles; published reports considered authentic—as solid triangles; and “other records” such as personal communications, both oral and written, from other collectors, when the information seemed credible on the basis of the known distribution—as open triangles.

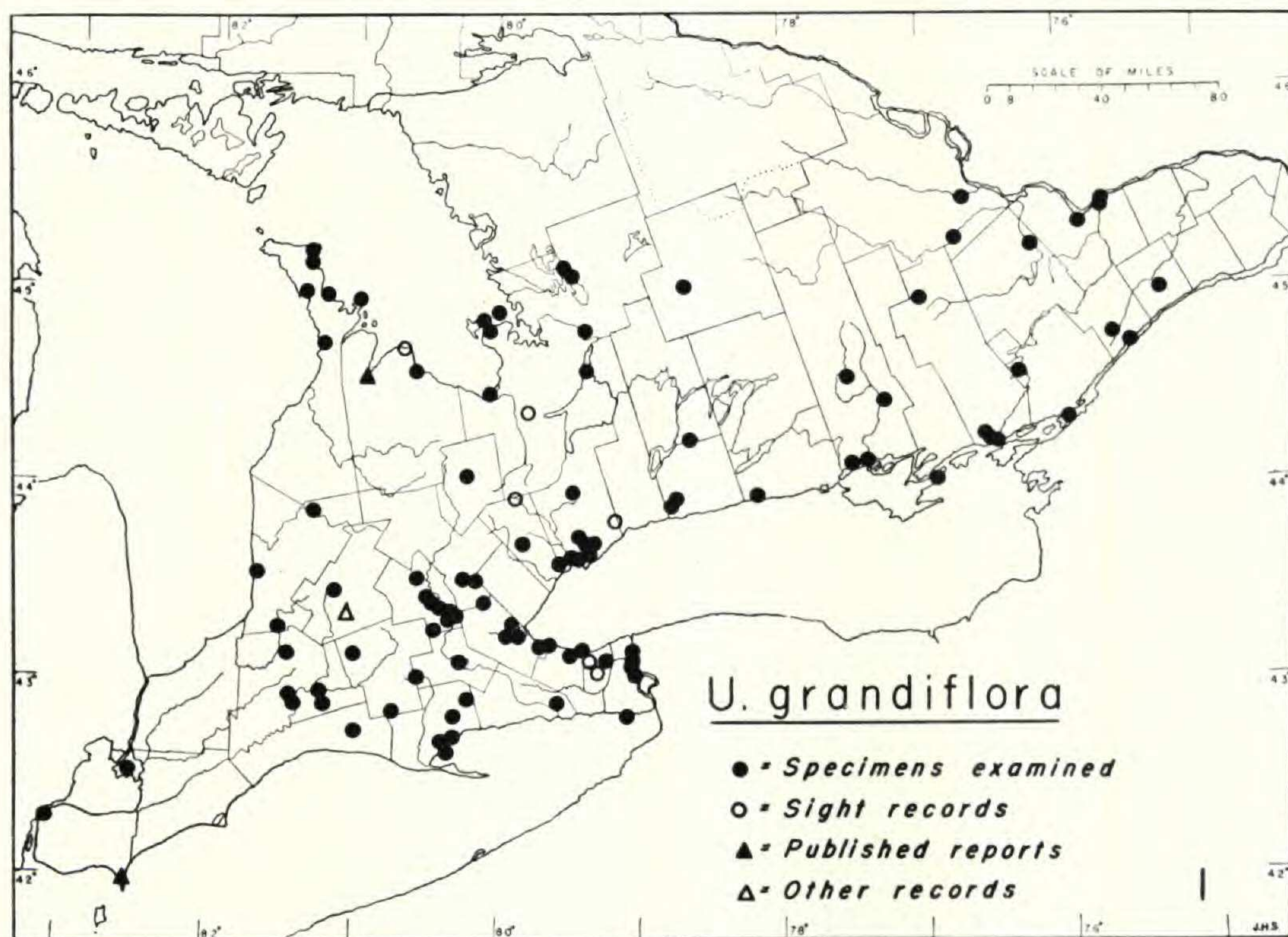
The following are the abbreviations used to designate the herbaria from which specimens² were examined: BUF—Buffalo Museum of Science, Buffalo, New York; CAN—National Museum of Canada, Ottawa, Ontario; DAO—Division of Botany, Department of Agriculture, Ottawa, Ontario; FFT—Faculty of Forestry, University of Toronto, Toronto, Ontario; MT—Montreal Botanical Garden, Montreal, Quebec; McM—McMaster University, Hamilton, Ontario; OAC—Ontario Agricultural College, Guelph, Ontario; QU—Queen’s University, Kingston, Ontario; TRT—Department of Botany, University of Toronto, Toronto, Ontario; WO—University of Western Ontario, London, Ontario.

1. ***Uvularia grandiflora*** J. E. Smith—In Canada known from southwestern Quebec, southern Ontario (see fig. 1), [probably in western Ontario near the borders of Manitoba and Minnesota (but no specimens seen)], and southeastern Manitoba. It grows in deciduous woods, mixed deciduous and coniferous woods, along wooded banks of streams and slopes of wooded ravines, or occasionally in open rocky woodland. The following, from 163 sheets examined, are cited as county and district records:

ONTARIO: BRANT: New Durham, May 4, 1927, *R. F. Cain* (TRT). BRUCE: rich woods, Dyer’s Bay, June 29, 1936, *P. V. Krotkov 10412* (TRT). CARLETON: open rocky woodland, vicinity of Ottawa, May 8, 1946, *A. J. Breitung 2127* (DAO). DUFFERIN: Shelbourne, May 21, 1898, *Wm. Scott* (TRT). DUNDAS: Williamsburg, June 20, 1903, *E. J. Wells* (QU). DURHAM: low wet woods about one mile n. of Courtice, June 13, 1950, *Soper & Shields 4621* (TRT). ELGIN: rich woods, Aylmer, May 10, 1898, *R. T. Anderson* (TRT). ESSEX: woods, Sandwich, June 5, 1901, *J. Macoun* (CAN). FRON-

² Most of the abbreviations used are from the list compiled by J. Lanjouw (7). In the case of the Department of Agriculture, Ottawa, the abbreviation DAO is preferred to OTB, since the former is the one more generally used in publications by phanerogamic taxonomists of that Department. For the herbaria not listed by Lanjouw, tentative abbreviations have been assigned, some of which are in general use.

TENAC: Kingston, 1907, *F. J. Pound* (QU). GRENVILLE: Mirwin's woods, w. of Prescott, May 14, 1859, [*B. Billings?*] (QU). GREY: edge of wooded hillside about one mile s.e. of Meaford, June 7, 1950, *Soper & Shields* 4608 (TRT). HALDIMAND: highland, two miles e. of Dunnville, May 17, 1951, *Bert Miller* (McM). HALIBURTON: Carnarvon, May 18, 1935, *R. C. Hosie* (FFT). HASTINGS: woods near Stoco, May 22, 1948, *A. J. C. Barry* (TRT). HURON: rich woods, Wingham, May & July, 1890, *J. A. Morton* (CAN). LAMBTON: oak-hickory woods, the Public Bush, Walpole Island, Aug. 4, 1950, *Soper &*

FIG. 1. *UVULARIA GRANDIFLORA* IN ONTARIO

Shields 5103 (TRT); open woods, [without exact locality], Moore Tp., May 1892, *Mrs. A. E. Gurd* (WO). LANARK: moist stream bank, Wolves Grove, lot 16, conc. VII, Ramsay Tp., May 23, 1939, *Senn & Minshall* 1243 (DAO, MT). LEEDS: Jones' Falls, June 8, 1895, *ex herb. J. Fowler* (QU). LINCOLN: in woods along south side of Queen Elizabeth highway, lot 5, conc. I, Clinton Tp., May 17, 1950, *Soper & Shields* 4358 (TRT); wooded ravine slope, near Beamsville, July 4, 1950, *Soper & Shields* 4877 (TRT); woods along slope below escarpment about two miles s. of St. Catharines, June 18, 1950, *Soper & Shields* 4717 (TRT). MIDDLESEX: beech-maple woods about three miles s.w. of Komoka, July 18, 1941, *J. H. Soper* 2735 (TRT). MUSKOKA: Urquhart's Farm, Port Carling, May 17, 1940, *L. C. Coleman* (TRT). NORFOLK: ravine hillside, Turkey Point, June 3, 1938, *J. H. Soper* 137 (McM). NORTHUMBERLAND: Cobourg, May 22, 1890, [collector not stated] (TRT). ONTARIO: between limestone blocks, open field, Atherley, May 24, 1949, *A. G. Edmund* (TRT). OXFORD: deciduous woods, about five miles n. of Thamesford, May 30, 1950, *Soper & Shields* 4512 (TRT); in woods about one mile w. of Tillsonburg, June 26, 1950, *Soper & Shields* 4815 (TRT). PEEL: Snelgrove, May 5, 1891, *Jas. White* (TRT). PERTH: damp maple-beech woods, lot 6, conc. IV,

Logan Tp., two miles n.e. of Mitchell, July 25, 1950, *J. K. Shields 212* (TRT). PRINCE EDWARD: rich open woods, Cressy, June 3, 1928, *J. Oughton* (TRT). RENFREW: Calabogie Lake, May 28, 1884, *ex herb. J. Fowler* (QU). SIMCOE: low wet woods, Thunder Beach, Georgian Bay, May 24, 1949, *Bruce Falls* (TRT); woods along bank of Nottawasaga River near its mouth, June 29, 1950, *Soper & Shields 4849* (TRT). VICTORIA: rich shady woods, Mt. Horeb, May 26, 1913, *N. C. Hart* (WO). WATERLOO: dry woods, Cressman's Wood, German Mills, May 6, 1939, *F. H. Montgomery 109* (McM, OAC). WELLAND: rocky woods, Niagara Glen, May 20, 1950, *Soper & Shields 4391* (TRT). WELLINGTON: woods, Arkell, May 15, 1933, *S. A. Simmons* (OAC). WENTWORTH: damp alluvial soil in wooded stream bed, between Waterdown and Aldershot (near Hamilton), May 22, 1951, *J. H. Soper 5164* (TRT). YORK: ravine slope at edge of woods, about one mile n. of Donlands Station, May 15, 1950, *Soper & Shields 4303* (TRT).

2. ***Uvularia perfoliata* L.**—This species is apparently restricted in Canada to the extreme southern part of Ontario, between the Niagara River and the western end of Lake Ontario (see fig. 2); it may possibly occur also in the southwestern part of Quebec. It is to be looked for in the Ottawa district and the eastern counties of southern Ontario. It grows in woods and thickets on upland sites, or on the slopes of wooded hillsides. The following sheets are cited from the twelve specimens examined from Ontario.

ONTARIO: LINCOLN: St. Davids, May 24, 1904, *Wm. Scott* (TRT); rich woods, Jordan Station, May 27, 1892, *J. Macoun* (CAN); south of St. Catharines, July 8, 1901, *J. Macoun* (TRT); thicket, Lincoln County [but without exact locality], June 3, 1906, *Wm. L. Putnam* (OAC). WELLAND: wooded ravine, between Fonthill and Ridgeville, May 22 & June 18, 1950, *Soper & Shields 4408 & 4712* (TRT); woods, Niagara, May 11, 1901, *J. Macoun* (CAN). WENTWORTH: dry upland woods, between Waterdown and Aldershot (near Hamilton), May 22, 1951, *J. H. Soper 5163* (TRT).

In addition to the above, a specimen was examined from the herbarium of Queen's University labelled "vicinity of Ottawa, May 1879, *M. Fletcher*" which is undoubtedly this species, but no other collections nor reports have been seen from that region. It may be assumed that the species once grew in the Ottawa district and is now either extinct there or so rare that it has escaped detection. An alternative possibility is that the information concerning the locality as given on the label is incomplete or inaccurate. J. M. Macoun reported in 1879 (9) that this species was known only from near Niagara and Jordan Station and stated that it was "very rare and not collected for many years." No

mention was made of the occurrence of *U. perfoliata* in the Ottawa district.

J. Fletcher, in his first check list for the Ottawa district published in 1879 (5, p. 58), listed all three species of *Uvularia* without specific localities. Later, in preparing the annotated edition of the Flora Ottawaensis, Fletcher (6, pp. 90–91) gave *Uvularia grandiflora* and *Oakesia sessilifolia* as common in the Ottawa district, but dropped *Uvularia perfoliata* from the list without comment.

Uvularia perfoliata was not known definitely to occur in Quebec by Louis-Marie (8), although it was later included in the Flore Laurentienne by Victorin (10) with the statement: "bois riches de l'ouest du Québec; rare." In a more recent paper by Raymond (11), in which many rare and southern species are listed for southern Quebec, *U. perfoliata* is not mentioned. If this species were abundant in the southwestern part of Quebec, the record for the Ottawa district or reports for eastern Ontario would seem more acceptable. Since such is not the case, it seems better to exclude the Ottawa record at least until verification or a more recent collection appears.

The restricted distribution of *U. perfoliata* in Ontario is difficult to explain in terms of the soil-preferences of this species. Accurate descriptions of habitat and associated species are lacking for all of the stations known to the author only through herbarium specimens. Only two stations for this species have been discovered and studied in Ontario by the author. Several writers have indicated that *U. perfoliata* is a plant of "acid to circumneutral soils" (4, p. 429) or "sterile gravelly or sandy, acid or subcalcareous soils" (13, p. 143). Likewise, *U. grandiflora* is said to occur in "rich woods and thickets, chiefly calcareous" (4, p. 429) or "in gravelly or alluvial calcareous rich soils" (13, p. 144). It seems probable that the same general statements can be applied to these two species in Ontario, but with only two stations for *U. perfoliata* which could be studied, no significant comparison could be made. For both stations, however, the general appearance was of a well-drained soil, the one a sandy kame moraine and the other an upland or sloping shale plain. A comparison of the associations of plants found where *U. perfoliata* was discovered by the author yields the following list of species common to the two sites:

TREES AND SHRUBS:

*Populus grandidentata**Fagus grandifolia**Castanea dentata*³*Quercus alba**Quercus rubra**Sassafras albidum**Hamamelis virginiana**Prunus serotina**Rhus radicans* var.*Rydbergii**Acer saccharum**Viburnum acerifolium*

HERBACEOUS SPECIES:

*Botrychium virginianum**Pteridium aquilinum*var. *latiusculum**Maianthemum canadense**Trillium grandiflorum**Hepatica americana**Ranunculus abortivus**Thalictrum dioicum**Geranium maculatum**Aralia nudicaulis*

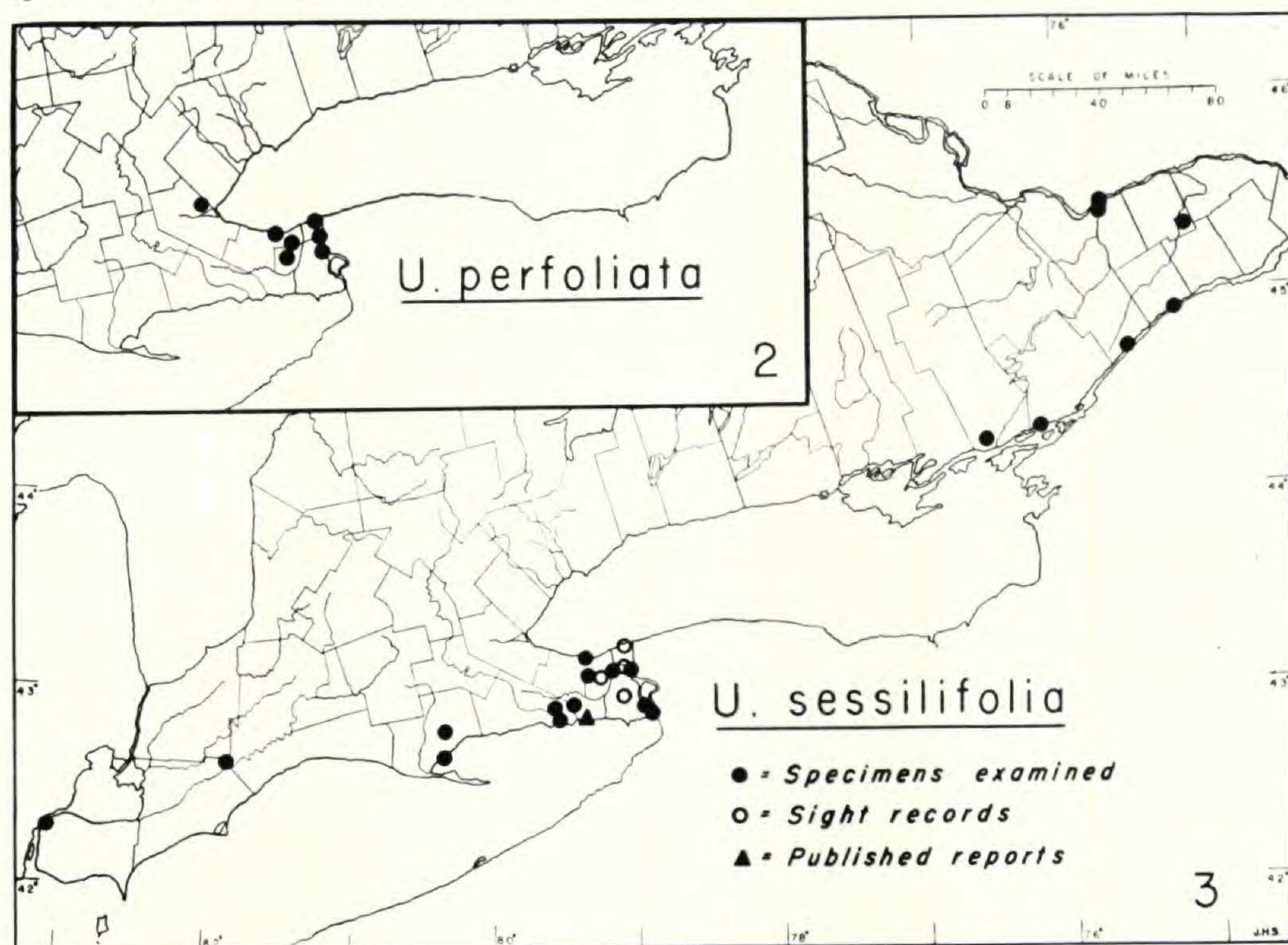
Among the species listed above are several which are at or near their northern limit in Ontario at the Niagara and Hamilton regions, such as *Castanea dentata* and *Sassafras albidum*. To these may be added the following, found at one or other of the two stations in Ontario for *U. perfoliata*: *Liriodendron Tulipifera*, *Cornus florida*, and *Swertia caroliniensis*. These southern species are restricted in Ontario to the so-called Carolinian Zone, the extreme southern portion of the peninsula of Ontario which lies between lakes Ontario and Huron. The stations for *U. perfoliata* shown on the map (fig. 2) represent the northwestern extension of the natural area of this species into a region of Ontario which contains a considerable number of southern species there reaching their northern limit in the province.

Finally, it may be noted that at neither of the two stations for *U. perfoliata* discovered in southern Ontario was *U. grandiflora* found in the same type of habitat. The latter species is common, however, throughout the same region. At the station between Waterdown and Aldershot the two species were growing in the same general area within three hundred yards of each other, but *U. perfoliata* was on well-drained wooded upland and *U. grandiflora* was in rich damp alluvial soil in the wooded stream-bed of a neighbouring ravine.

3. ***Uvularia sessilifolia* L.**—In Canada known from Nova Scotia, New Brunswick, Quebec, southern Ontario (see fig. 3), western Ontario (near the borders of Manitoba and Minnesota), and southern Manitoba. It is usually found in deciduous woods, frequently in rather dry, sandy, or grassy situations in open woods or clearings. The following are cited from the 45 sheets examined from the province:

³ Represented only by stump-sprouts.

ONTARIO: CARLETON: rich woods, Ottawa, June 9, 1878, *J. Fletcher* (TRT); open woods, Rideau River, lot 19, Junction Gore, Gloucester Tp., May 10, 1939, *W. H. Minshall* 9 (DAO). DUNDAS: dry island, Morrisburg, May 12, 1894, *A. H. D. Ross* (QU). ESSEX: Sandwich, June 5, 1901, [probably *J. Macoun*]⁴ (CAN, no. 13315). FRONTENAC: Cataraqui, May 27, 1896, *W. Nicol* (QU). GRENVILLE: Mirwin's woods, w. of Prescott, May 14, 1860, [probably *B. Billings*] (QU). HALDIMAND: edge of woods, near Port Maitland



FIGS. 2 AND 3. *UVULARIA PERFOLIATA* AND *U. SESSILIFOLIA* IN ONTARIO.

in Sherbrooke Tp., June 17, 1950, *Soper & Shields* 4709 (TRT). KENT: Bothwell, July 18, 1917, *M. Y. Williams* (CAN). LEEDS: Gananoque, 1939, *I. O'Driscoll* (DAO). LINCOLN: open woods, Vineland, May 18, 1940, *H. M. Harrison* (OAC). NORFOLK: lot 17, conc. VI, Charlotteville Tp., June 9, 1948, *M. Landon* (McM). RUSSELL: Casselman, May 16, 1891, *Wm. Scott* (TRT). WELLAND: Whirlpool, Niagara, May 24, 1898, *Wm. Scott* (TRT); woods near Crescent Beach, Bertie Tp., June 14, 1930, *C. A. Zenkert* (BUF); open woods near Wainfleet (Marshville), June 1, 1930, *C. A. Zenkert* (BUF); open grassy woods about three miles w. of Fort Erie North, May 20 & July 5, 1950, *Soper & Shields* 4398 & 4887 (TRT); Thorold, May 15, 1911, *M. O. Malte* (CAN).

This species was said to be common in Lambton County by *C. K. Dodge* (3), although no specimens have been seen from that area during the course of the present study.⁵

⁴ Deduced by a comparison of handwriting with that on labels of other specimens. *U. grandiflora* was collected at Sandwich by Macoun on the same day.

⁵ *C. K. Dodge's* herbarium at the University of Michigan does not contain a specimen of this species from Lambton County, Ontario, according to Dr. Rogers McVaugh (*in litt.*), although there is one there which was collected at Port Huron, Michigan, opposite Sarnia.

ACKNOWLEDGEMENTS

This study was carried out with assistance of a grant-in-aid of research furnished by the University of Toronto. Field work has also been supported by the University of Toronto, the Dominion Department of Agriculture, and the Research Council of Ontario. The author is indebted to the curators of the herbaria from which material was sent on loan for study. He also wishes to express his gratitude to Mrs. Margaret Heimbürger, who assisted greatly in the recording and plotting of the data.

SUMMARY

The identity and geographical distribution of *Uvularia grandiflora*, *U. perfoliata*, and *U. sessilifolia* have been discussed. Distribution maps show locations in southern Ontario from which these species are known and selected groups of specimens have been cited to give a record of sources of material for the counties and districts. The finding of one hitherto unreported station for the rare *U. perfoliata* in the Niagara district and of a second in the vicinity of Hamilton establishes the existence of this species, which apparently has not been collected in Ontario for nearly fifty years.

REFERENCES

1. ANDERSON, E. AND WHITAKER, T. W. 1934. Speciation in *Uvularia*. Journ. Arnold Arb. **15**: 28-42, pls. 82, 83.
2. DEAM, C. C. 1940. Flora of Indiana. State of Indiana, Dep't of Conservation, Indianapolis, Indiana.
3. DODGE, C. K. 1914. The Flowering Plants, Ferns and Fern Allies growing without cultivation in Lambton County, Ontario. 16th Ann. Rep't Mich. Acad. Sci., 132-200.
4. FERNALD, M. L. 1950. Gray's New Manual of Botany, 8th edition. Amer. Book Co.
5. FLETCHER, J. 1879. Flora Ottawaensis. Trans. Ottawa Field Nat. Club **1**: 28-61.
6. FLETCHER, J. 1894.⁶ Flora Ottawaensis (The last section published). Ottawa Nat. **7**: 78-101.
7. LANJOUW, J. 1939. On the Standardization of Herbarium Abbreviations. Chron. Bot. **5**: 142-150.
8. LOUIS-MARIE, PÈRE. 1931. Flore-Manuel de la Province de Québec. Contrib. no. 23, Inst. Agric. d'Oka.

⁶ This work (101 pp., not completed) is usually cited as having been published from 1888-1893, but the last section, pp. 78-101, containing the references to *Uvularia* and *Oakesia* was published on March 1, 1894, according to the date given on the paper cover of parts 11 and 12 (issued together) of volume 7 in the bound copy at the Legislative Library of the Parliament Buildings in Toronto.

9. MACOUN, JAMES M. 1897. Contributions to Canadian Botany—X. Can. Rec. Sci. 7: 267–286.
10. MARIE-VICTORIN, FRÈRE. 1935. (Reprinted 1947) Flore Laurentienne. Les Frères des Écoles Chrésiennes, Montréal.
11. RAYMOND, MARCEL. 1950. Esquisse Phytogéographique du Quebec. Mem. Montreal Bot. Gard. 5, 147 pp.
12. SOPER, JAMES H. 1949. The Vascular Plants of Southern Ontario. 95 pp. Pub. jointly by the Department of Botany, University of Toronto and the Federation of Ontario Naturalists, 100 Queen's Park, Toronto.
13. WIEGAND, K. M. AND EAMES, A. J. 1926. The Flora of the Cayuga Lake Basin, New York. Cornell Univ., Agric. Exper. Sta., Mem. 92, 491 pp. Ithaca, N. Y.

SOME NOTES ON UNITED STATES TREE NAMES

WILLIAM A. DAYTON

HEREWITH are some observations on the scientific names of the pines in Walter's "Flora Caroliniana" and in the so-called "Walter Herbarium" in London, as well as of knobcone pine, bristlecone fir, two oaks, and the Florida doveplum; also, on the significance of the name "loblolly pine."

THOMAS WALTER'S PINES

Thomas Walter, in his "Flora Caroliniana" (1788), briefly describes (p. 237) five species of pines, as follows:

- | | |
|--------------|---|
| "glabra 1. | foliis geminatis, strobilo oblongo-ovato brevi, cortice glabro. |
| suarrosa 2. | foliis geminatis glabris brevibus, strobilo ovato brevi, squamis subretrorsum mucronatis, cortice scabro. |
| palustris 3. | foliis trinis sesquipedalibus, strobilo subulato, spinis adscendentibus. |
| lutea 4. | foliis trinis pedalibus, strobilo ovato-subulato, spinis rectis. |
| Cedrus? 5. | foliis, strobilo subgloboso squamis apice, spinis retrorsum imbricatis." |

Walter's italic and roman type in the specific names above are not explained by his prefatory note: "Notam dubietatis ad nomen genericum ponere, et differentias typis italicis indicare, saepe contentus fuit"—which appears to be his only interpretation of his italicization.

In the above catalog *Pinus glabra*, *lutea*, and *suarrosa* appear to be new species and original publications by Walter. No. 3 undoubtedly is longleaf pine (*P. palustris* Mill.). His fifth